

1: INTRODUCTION

1.1 Project Overview

The I'SOT (In Search of Truth) community proposes to construct and operate a geothermal district heating system in Modoc County, California (Figure 1.1-1). The district heating system involves

- Producing geothermal fluid (hot water) from an existing well
- Using the heat from the geothermal fluid to heat community water
- Piping the heated community water through a distribution piping system to provide space heating.

The cooled, filtered geothermal fluid will be discharged to the Pit River. The proposed action also includes construction and heating of a new food service and laundry building, as well as construction of a mechanical building to house system controls. The potential next project phase is the drilling of an injection well to eliminate discharge to the Pit River. The proposed project area is shown in Figure 1.1-2.

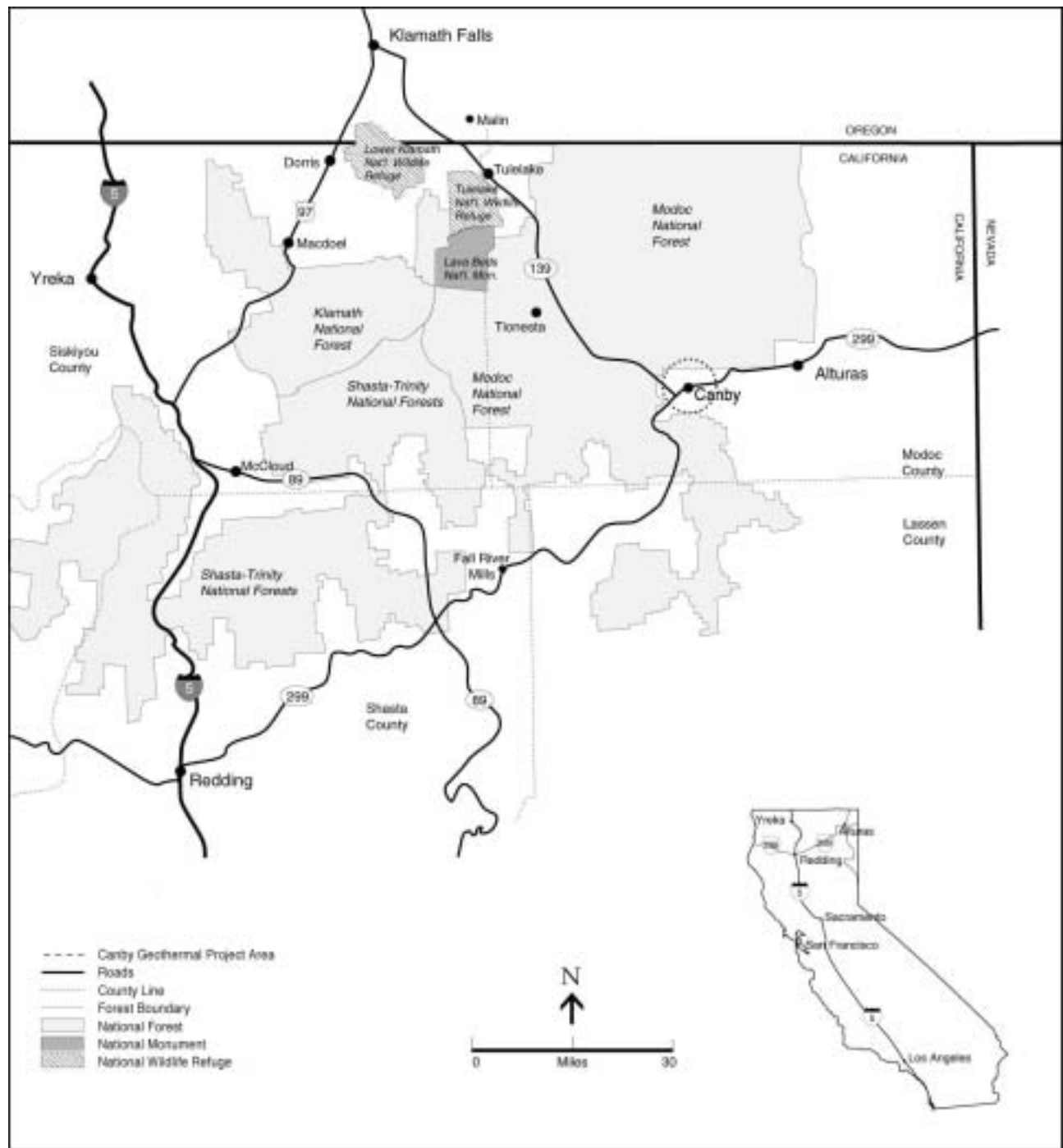
The U.S. Department of Energy (DOE) is considering providing partial funding for this district heating project for construction and operation for 3 years. The DOE is acting as the lead agency under the National Environmental Policy Act (NEPA). The DOE will consider the findings of this Environmental Assessment prior to making a decision to fund the project. The California Energy Commission (CEC) and the I'SOT community are providing additional funding for this project.

1.2 Purpose and Need

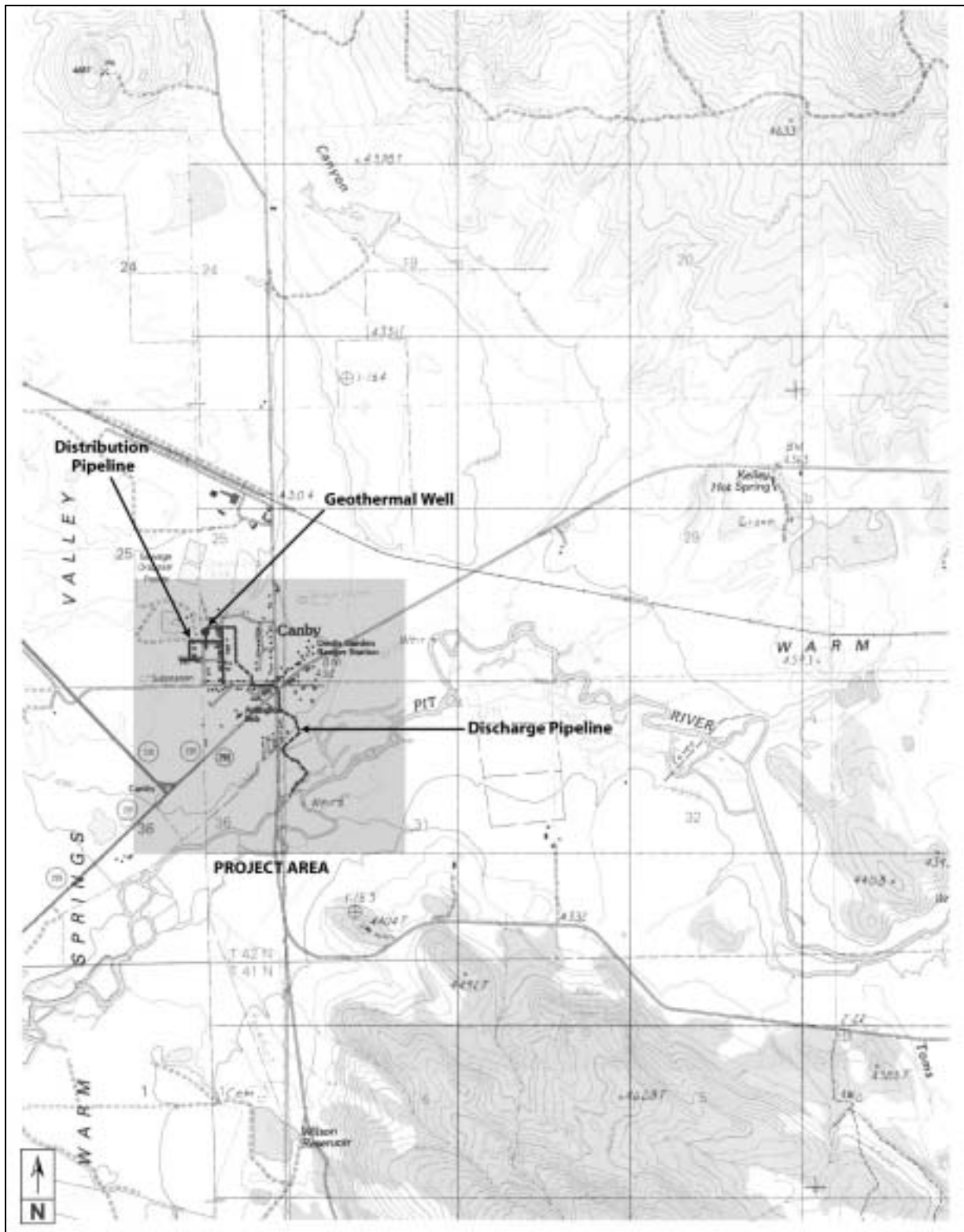
PURPOSE

The purpose of the proposed action is to construct and operate a direct-use heating system for the I'SOT Community in Canby, California. As the cost of energy increases over time, there will be more small communities looking at developing the geothermal reserves in their area. I'SOT spends between \$21,000-\$42,000 annually in propane costs for residential space heating and domestic hot water (Merrick

Figure 1.1-1: Regional Location Map



SOURCE: BLM et al 1998

Figure 1.1-2: Proposed Project Area

SOURCE: USGS et al 2002

2002). This project would construct the piping and pipeline required for the direct-use system to reduce costs and dependence on propane for power.

One of the goals of the DOE/NREL Geothermal Program is to support the development and installation of low-to-medium temperature geothermal direct use technology as a technically feasible, practical and cost-competitive energy option in the United States (NREL 2002). In response to Request for Proposals (RFP) [RFP #RAA-1-31402, Development and Field Verification of Innovative Geothermal Direct-Use System Concepts], the I'SOT Community was competitively selected for negotiation of award. This funding award triggered the need for an environmental review by the DOE. Interest in the use of low-to-medium temperature (80 to 350°F) geothermal resources for direct use applications has been growing steadily. The vast majority of the nation's geothermal resource base consists of low-to-medium temperature resources; resources that are more likely to be technically feasible and economically viable for direct use applications.

No material costs are to be funded by DOE. DOE funding for the Canby District Heating Project would reimburse the following project components:

- Permitting Costs
- Engineering Costs
- System Installation labor
- Installation and implementation of the data gathering system for DOE Research and Development purposes

NEED

Recent events in electricity and gas demand indicate the need for alternative power sources. Although conservation is cited as a source of additional power to meet this need, conservation alone is not expected to meet all of the demand. Renewable energy sources, such as geothermal energy, already supply a significant amount of direct-use heating to western states such as Arizona, California, Nevada, Oregon, and Utah. Existing and improved technology for geothermal utilization will allow a broadening use of this resource. The National Energy Policy calls for increased domestic energy production, including the use of renewable energy (National Energy Policy Development Group 2001). The Federal government's position on geothermal power is that it will add sustainable economic development, create jobs, and support cleaner local and regional environments (GeoPowering the West 2000). Similar legislation has been introduced in the state of California in order to promote the use and development of renewable energy.

The need for the proposed action has been established by the U.S. Congress in the Geothermal Steam Act of 1970 and by the California legislature in the Warren-Alquist Act of 1974, both of which encouraged geothermal development as a means to diversify energy supplies. Other acts (including the Federal Land Policy and Management Act of 1976, the Public Utility Regulatory Policies Act of 1978, and the National Materials and Minerals Policy, Research, and Development Act of 1980) also identify the need to develop alternate energy resources.

1.3 Scoping and Agency Roles

SCOPING

DOE sent a scoping letter to public agencies and other interested parties on September 6, 2002 to solicit comments on the scope of the EA. Comments received during the scoping period are included in Appendix A. Responses to the scoping comments are incorporated into this document.

Letters were mailed and faxed to the Pit River Nation Tribal Representatives and nearby tribes to initiate nation-to-nation consultation (Appendix A). A meeting was held on September 10, 2002 with three representatives of the Pit River Nation. DOE agreed to hold additional meetings as requested by the tribe members. I'SOT agreed to contact officers of the Pit River Tribe regarding presence of an archaeological monitor during project construction.

On October 1, 2002 MHA Environmental Consulting, Inc. (MHA) sent a letter to the Native American Heritage Commission (NAHC) requesting a sacred sites record search. The NAHC responded that the record search failed to indicate the presence of Native American cultural resources in the immediate project area. The NAHC included a list of five tribal contacts in the project area to contact with the same request. DOE sent a letter to these five contacts on October 21, 2002 asking for comments and concerns. A follow-up phone call was made to each contact by MHA staff on November 12, 2002. Michelle Berditshevsky at the Pit River Tribe Environmental office in Burney stated that a water resources specialist from the tribe had expressed concern regarding the effluent discharge. Ms. Berditshevsky indicated that comments regarding the water quality and biology effects due to the discharge would be provided by the tribe when the Draft EA was available for review.

AGENCY ROLES AND PERMITTING PROCEDURES

National Environmental Policy Act

This EA was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), which requires environmental review of the proposed action to aid the decision maker in review of the proposed project. The DOE Golden Field Office Manager will make the decision concerning this proposed project.

The proposed action would require discretionary approval from a Federal agency. The proposed action is therefore subject to environmental review pursuant to NEPA. This document has been prepared as an Environmental Assessment (EA) in order to meet requirements of NEPA. This document has been prepared by a third-party consultant and distributed to tribes and agencies (Appendix B) under the direction of the lead agency, in accordance with NEPA guidelines.

Permitting Procedures

The NEPA review is required because the National Renewable Energy Laboratory (NREL), a private contractor for the Department of Energy, would provide funding for the proposed project. Related permits triggered by the proposed project are consideration of the potential project impacts to wetlands under Section 404 by the US Army Corps and potential effects of the project to endangered species under Section 7 by the US Fish and Wildlife Service. The effects to cultural resources will be considered in accordance with Section 106 of the National Historic Preservation Act (NHPA).

The proposed project is located in Modoc County, California. The DOE will make a decision whether NREL will fund the project installation. This funding made the DOE the lead Federal agency for NEPA review of the proposed action. Due to the identification of wetlands within the route of the discharge pipeline, the US Army Corps would need to issue a Section 404 permit. This makes the Army Corps a responsible agency under NEPA. Additional authorization is required from other federal, state, and local agencies.

The description of agency roles below provides information on the decisions that must be made by each agency.

U.S. Army Corps of Engineers

Construction of the 5,400 feet of discharge pipeline that includes construction along a levee road and in the wetlands would require that I'SOT obtain a Section 404 permit from the Army Corps. The proposed pipeline construction would cause some effect to wetlands in the area; therefore, the Corps would have the authority to issue a Nationwide or Individual wetland fill permit for the proposed action.

Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board (CVRWQCB) has jurisdiction over waste discharge to land and is responsible for issuing permits for discharging fluids to well pad sumps and injection of geothermal fluids under the National Pollutant Discharge Elimination System (NPDES). The CVRWQCB issued Wastewater Discharge Order No. R5-2002-0079/ NPDES No. CA0084859 for the project on April 26, 2002. This permit is included in Appendix C. This order covers the pipeline discharge of geothermal effluent to the Pit River. The RWQCB also has authority to issue a Section 401 Water Quality Certification for discharge to wetlands. As noted above, the proposed pipeline would include some effect to wetlands in the area; therefore the RWQCB would have the authority to issue a 401 Certification, should they desire to do so.

REQUIRED PERMITS AND APPROVALS

Table 1.3-1 lists the decisions or permits that must be issued by each agency.

Table 1.3-1: Required Permits and Approvals

Project Component	Project Action	Permits/Approvals Needed	Permit Status
ISO-1 well site and development of heating district	Construct well pad, distribution piping, and discharge pipeline	Modoc County Planning-Use Permit	Addendum to CEQA and modification of Use Permit for pipeline route change to be submitted <u>pending approval</u>
Discharge pipeline	Stream crossings	CDFG-Streambed Alteration	Permit issued
Discharge pipeline	Wetlands	US ARMY CORPS-SECTION 404, CVRWQCB-SECTION 401	Applications to be submitted for NWP 12 to Corps and Section 401 to RWQCB

Project Component	Project Action	Permits/Approvals Needed	Permit Status
Discharge pipeline	Directional Bore for conduit (3-inch) beneath State Route 299	California DOT-Encroachment Permit	Permit issued
Discharge pipeline	Geothermal effluent discharge to Pit River	CVRWQCB-Waste Discharge (NPDES)	Conditional permit issued

Notes:

CDFG=California Department of Fish and Game

CVRWQCB=Central Valley Regional Water Quality Control Board

DOT=Department of Transportation

SOURCE: MHA 2002

1.4 Project Background

GEOTHERMAL RESOURCE

The I'SOT (In Search of Truth)¹ Community proposes to construct a district heating system in order to harness geothermal energy to heat buildings in Canby, California. Geothermal energy is heat energy produced from the earth. Most direct-use applications employ shallow geothermal waters with low heat contents, and operate on smaller fluid volumes in contrast to electric power generation (DOE 1995). Both the hot water, and steam produced from the hot water, are discovered through geothermal exploration programs and brought to the surface by drilling wells. The hot water is then routed through a plate heat exchanger. Heat is transferred from the geothermal fluid to the domestic water, and then the hot water is distributed through buried pipelines to heat various buildings within the community. The geothermal fluid produced from the well would be discharged to the Pit River.

PREVIOUS ENVIRONMENTAL DOCUMENTATION

In August 1998, the DOE Idaho Operation Office granted a financial assistance award (75% DOE/25% I'SOT) to drill an exploratory well. This award was contingent on a matching award from the California Energy Commission (CEC) for material funding for a district heating system. In January 1999, I'SOT responded to a geothermal Research and Development solicitation from the CEC and was awarded a materials only award for \$304,525. The California Division of Oil, Gas, and Geothermal Resources (DOGGR) as the lead agency, conducted an environmental review for the well drilling under the California Environmental Quality Act (CEQA), resulting in a Negative Declaration in September 1999. The Modoc County Planning Department as lead agency, conducted an environmental review for the use of the geothermal well and development of a district heating system under CEQA, resulting in an Initial Study/Mitigated Negative Declaration in September 2001.

¹ I'SOT is a society of people organized since 1969, as a community, exclusively for charitable, religious, and educational purposes within the meaning of section 501-c-3 of the Internal Revenue Code.

EXPLORATION ACTIVITIES

Drilling for the geothermal resource began on April 6, 2000. The original estimated depth to encounter the geothermal resource was 1,600 feet. I'SOT drilled a 2,100 foot well to use the geothermal water for district heating in April 2000. The resource was found on June 8, 2000 with a bottom hole temperature of 223° F and an estimated flow of 200-300 gallons per minute (gpm). A pump test resulted in the conclusion that the resource would have a long- term productivity rate of 37 gpm at about 180° - 190° F (Bohm 2000). Appendix D contains the complete Well Testing report.

In January 2001, NREL offered a 50/50 direct-use solicitation to fund the permitting, engineering, and installation of the I'SOT project.

1.5 Organization of this EA

This EA describes the existing environment, presents an analysis of the environmental consequences of the proposed project construction and operation, describes the effects of the alternatives to the proposed project, identifies mitigation measures to reduce impacts, and addresses the concerns of the interested parties who commented on the proposed project.

The information presented in this environmental analysis was obtained from personal communications with members of the US Army Corps, USFWS, US EPA, Central Valley Regional Water Control Board, and California Department of Fish and Game; site-specific surveys; and previous project documents. The documents referenced in this document include:

- Canby Geothermal Well Drilling Project IS/MND (DOGGR 1999)
- Geothermal Well History (DOGGR 2000)
- Adopted Waste Discharge Requirements for I'SOT Inc. Geothermal Project, Modoc County (CVRWQCB 2002)
- Well Testing at the ISO-1 Geothermal Well, Canby, Modoc County, CA (Bohm 2000)
- Mixing Zone Study for the I'SOT Geothermal Effluent Discharge Permit Application, Canby, Modoc County, California (Bohm 2001)
- Preliminary Investigation Regarding the Removal of Mercury from Geothermal Groundwater (I'SOT) (Bloom 2001)
- Archaeological Reconnaissance for the Proposed I'SOT Geothermal District Heating Demonstration Project, Canby, Modoc County, California (Vaughan 2001)
- Canby Geothermal Well Use and District Heating System Development Project IS/MND (Modoc County Planning Department 2001)
- Canby Geothermal Well Drilling Project IS/MND (DOGGR 1999)